

LIST OF IDRC ACTIVITIES IN BIOTECHNOLOGY

Prepared by:

Chusa Gines, Ph.D.

October 24, 1991

This compiled list represents an overview of the number and types of activities having a biotechnology component at IDRC. Although the list is extensive, it is not inclusive. The intention in preparing this list was to facilitate quick access to information which will be used in-house, by the members of the Biotechnology Committee, and others who are interested.

It is hoped that it will serve as a frame of reference to outside activities, to identify strengths and weaknesses, and to offer a sense of future direction.

LIST OF IDRC ACTIVITIES IN BIOTECHNOLOGY

POLICY ANALYSIS AND PRIORITY SETTING

Two activities and three projects supported by the Centre:

Biotechnology Market Entry and Industrial Policy:

* IDRC-MR279e *Developing Countries and the New Biotechnology. Market Entry and Industrial Policy*. F.C. Sarcovich and M. Leopold, January 1991. Comprehensive global study, which incorporates three Latin American country case studies.

Funded by SS. Report is available.

Biotechnology strategy

* Biotechnology strategy (Mexico) [Solleiro] (91-0172).

This is an strategic study to develop methodology for priority setting and for research, development and policy implementation in biotechnology that have the greatest potential for delivery of the benefits of improved food production, income and employment generation in the food sector and health benefits in the health sector. This will be a model for use in other sectors and countries.

Funded by AFNS (PPS) and SS (EP).

Assessment of bioengineering capabilities

* Biotech Review (Aguilera, Chile) DAP (91-4105-45).

An assessment of the capabilities and needs in engineering aspects of biotechnology implementation in Latin America that would facilitate transfer of results from laboratory to pilot plant to industrial scale.

Funded by AFNS (PPS)

Technology Perspectives

* Technology Perspectives (Latin America) (86-0138)

The draft of the final report "*Las Nuevas Tecnologías y el Futuro de América Latina; Riesgo y Oportunidad*" was done in July, 1991. This project looks at issues of new technologies in development in order to formulate a long-term scientific and technological strategy for the region. The section of biotechnology (as a part of new technologies) is centred on the agro-industrial sector.

Funded by SS. Report is available.

Regional reports on Agriculture Biotechnology

Various studies undertaken by AFNS will assist in the development and application of a policy on biotechnology. Through their regional offices, several reports were hired to gather information on the state and current status of biotechnology research in the different regions, as follows:

- * WARO (West Africa)
- * LARO (Latin America)
- * EARO (Eastern and Southern Africa)
- * ASRO (South East Asia)
- * MERO (Middle East)

J.L. Ngu and J.M. Gopo
Claudia Botti
Calestous Juma
Theresita M. Espino
Douglas Beck

TOPICS COVERED

1. Regional view on biotechnology
 2. National policies/programs in biotechnology
 3. Research activities
 4. Promising research areas
 5. Patent regulations/environmental and biosafety laws
 6. Private sectors activities
 7. International donors activities/IARCs
 8. Constraints to future growth.
- Funded by AFNS. Reports are available.

PRODUCT/PROCESS DEVELOPMENT

Earth and Engineering

- * Sugar Cane Waste Utilization: Cuba (3-P-87-1024)
- EES supports research for the biotransformation of agricultural waste for the production of pharmaceutical end products.
- * Improved processing techniques for low-grade jute and cuttings - Bangladesh (3-P-89-1019).
- Use of microorganisms for the development of appropriate processing practices for jute and the definition of new technologies.
- Both funded by EES.

Health

- In the area of health, the projects with a biotechnology component can be classified in three main areas: (a total of 30)
- * Botanical Products - pesticides and herbicides, with concerns for human diseases, including toxicological studies (7 projects).
 - * Vaccines - development and testing of vaccines (hepatitis B, yellow fever and measles). Very advanced development of an anticonceptive vaccine (12 projects).
 - * Diagnostics - pro-tests and dipsticks. Work on Aids diagnosis, diagnosis of dengue fever and other epidemiological studies (11 projects).
- All the projects funded by HS.

Agriculture

- In the area of agriculture, and more specifically related to crop production, there are a wide range of research activities:
- * Cell tissue culture of plant species, including trees (16 projects).
 - * Pest resistance and biological pesticides (3 projects)
 - * Biological nitrogen fixation (3 projects)
 - * Monoclonal antibodies for disease detection (2 projects)
 - * Germplasm conservation (2 projects)
- All the projects funded by AFNS.

It should be noticed that some of the areas supported can fall under different divisions and programs (for instance, botanical herbicides research can have applications in agriculture and health).

ACCESS TO TECHNOLOGY AND TRANSFER

Information Sources and Systems

IDRC activities include three reviews on biotechnology information sources:

* ISM85-13. *Information Services on Biotechnology*. K.P. Broadbent. May 1985. Brief review of information aspects to define priority topics of interest to developing countries.

* ISM85-33. *Evaluation of Biotechnology Data Bases*. B. Chataway. May 1985.

Both are IS documents. Copies are available.

* Biotech Information Systems (Somaroo). (89-4097)

Literature survey : "A review of Recent Biotechnology Information Sources". Prepared by B.H. Somaroo for AFNS. Presented to the CGIAR Task Force on Biotechnology on Oct. 28, 1989.

Funded by AFNS. Report available.

Options for Collaboration with Canadian Institutions

* Biotechnology Inventory (MTL-Biotech.) (89-2004)

This study is an in-depth review of Canadian biotechnology expertise in agriculture of relevance to developing countries.

Funded by AFNS. Report available.

* Fisheries/Aquaculture Biotechnology in Developing Countries: Options for IDRC. Vancouver meeting, March 1991. MTL Biotech Ltd.

This study was conducted to assist IDRC in identifying Canadian capability and interest in developing country application of fisheries/aquaculture biotechnology.

Funded by AFNS. Report available

Technology Transfer

* Biotechnology Transfer ISAAA (3-P-91-0159)

IDRC is exploring its role in establishing linkages to facilitate biotechnology access and acquisition as a cosponsor for an organization recently established to act as a broker for biotechnology transfer. The International Service for Acquisition of Agri-Biotech Applications, known as ISAAA, was established as a response to a perceived need, that of facilitating the transfer of proprietary biotechnology applications from industrial countries, particularly the private sector, for the benefit of LDCs. ISAAA has a very specific action orientated pragmatic mandate specifically designed to deliver near-term proprietary applications that can be tested in specific agricultural project activities.

Funded by AFNS and COMM. (with future commitment by SS).

INTELLECTUAL PROPERTY RIGHTS (IPR)

Plant-Related IPR

* Plant Genetic Resources - IPR Working Group (3-P-90-4071)

* Keystone Dialogue - PGR; DAP (91-41-03).

IDRC has collaborated with the effort on "the Keystone

International Dialogue Series on Plant Genetic Resources" and hosted a "mini-dialogue" on IPR, with participation of representatives from industry, the research community, NGOs and developing countries. The recommendations from this dialogue series will be presented at the 1992 UN Conference on Environment and Development.

Funded by AFNS. Report available.

* International Symposium and Workshop on *Property Rights, Biotechnology and Genetic Resources: Creating Incentives for Innovation, Conservation and Development*, Nairobi, Kenya, June 1991. Partially sponsored by IDRC. The aim of the meeting was to develop effective incentives for the developing world to conserve and utilize biological diversity in a sustainable way. Some funds from SS. Information available.

Plant Breeder's Rights

* Plant Breeders Rights (Fisher) (89-2014)

Work has been supported on examining the implications of Plant Breeders' and Patent Rights, and evaluating its impact on research in Canada, in developing countries and on farmers.

Funded by AFNS. Report available.

UTILIZATION OF RESEARCH RESULTS, LINKAGE WITH PRODUCTIVE SECTOR.

University/Productive Sector Linkages

* *Interregional Workshop on Universities and the Application of Research Results: Institutional Innovations and Linkages with the Productive Sector*. To date, six such workshops have taken place:

- Singapore (September 1988)
- New Delhi (September 1988)
- Cordoba, Argentina (December 1988)
- New Delhi (December 1989)
- Alexandria, Egypt (December 1989)
- Harare, Zimbabwe (August 1990)

IDRC supported a series six regional workshops on university-industry linkages in developing countries as strategies for application of research results. Cases studies presented included several biotechnology examples, where university-local industry alliances were established to ensure research was designed to suit local industries needs.

Funded by Office of the Vice-President Program .

Communication Strategies for Bioindustry

* *Communication Strategies in Applied Scientific and Technical Research in Thailand. Phase I and II* (3-P-89-1045)

This project studies communication strategies in applied and technical fields for bioindustries in Thailand. This study looks into options for improvement of effective relationships between users and producers of innovations, and it intends to develop a system for evaluating the potential of indigenous research and analyzing industrial innovation potential.

Funded by COMM. Reports available.

SOCIO ECONOMIC IMPACT. BIOSAFETY

Impact of patenting

* Cultural Concerns in Biotechnology (DAP 91-4103-43).

A report on biotechnology and cultural aspects, including impact of patenting of life forms.

Funded by AFNS in collaboration with SSD. Report available.

* Women's knowledge, Management and Control of Seed Genetic Resources (3-P-89-0034).

This project includes a component to study one of these aspects, related to the control of biotechnology by transnationals and loss of indigenous capability to develop adapted technologies. Specifically it examines the impact of patenting of new improved seeds by multinational companies on small-scale farmers.

Funded by SS (Gender and Development).

Biosafety

* Regional Reports on Agriculture Biotechnology (also see under policy analysis).

These AFNS studies also gathered information on the concerns for the potential negative impact and the environmental implications associated with the introduction of biotechnology. Information on the absence of laws and regulations for biosafety in most developing countries was collected.

PARTICIPATION AT INTERNATIONAL FORA

IDRC in all its Divisions supports the participation of developing country researchers at meetings, conferences, workshops and symposia, where biotechnology issues of relevance to developing countries are being discussed. Some examples of activities sponsored by IDRC are:

African Biosciences Network (ABN) and UNSTCD collaborative workshop on "*Biotechnology for Food Production in Dry Areas, a Regional Assessment*" in Dakar, Senegal, October 1990. The workshop aimed at outlining concrete policy options and strategies available to African countries in the utilization of biotechnology to increase food production in dry areas of the continent.

* IITA Biotechnology Workshop (Gleddie) (90-2015-P-VO1)

Conference on "*Application of Biotechnology for the Improvement of African Crops*". This conference was organized by IITA to discuss appropriate biotechnologies for use in the African context, in order to enable IITA, national programs, and interest donors like IDRC to set priorities for support to research using these tools. Funded by AFNS. Travel report available.

TABLE 1.

IDRC ACTIVITIES IN BIOTECHNOLOGY

Description	Latin America	Asia	Africa	Global
POLICY ANALYSIS & PRIORITY SETTING				
- Biotech Market Entry & Industrial Policy				X
- Biotech Strategy in Food & Health Sectors	X			
- Assessment of Bioengineering Capabilities	X			
- Technology Perspectives	X			
- Regional Reports on Agriculture Biotechnology	X	X	X	
PRODUCT PROCESS DEVELOPMENT				
a) Earth & Engineering				
- Biotransformation & Bioprocessing	X	X		
b) Health Science				
- Botanical Products	X	X	X	X
- Vaccines	X	X	X	
- Diagnostics	X	X	X	X
c) Agriculture (Plants)				
- Cell Tissue Culture	X	X	X	
- Biological Pesticides & Pest Resistance	X	X	X	
- Biological Nitrogen Fixation	X		X	
- Monoclonal antibodies		X		
- Germplasm Conservation & Selection	X	X	X	
ACCESS TO TECHNOLOGY & TRANSFER				
- Information Sources & Systems				X
- Collaboration Options with Canadian Institutions				X
- Transfer (ISAAA)				X
INTELLECTUAL PROPERTY RIGHTS				
- Plant-related (Keystone) IPR				X
- Plant Breeders Rights				X
UTILIZATION OF RESEARCH RESULTS				
- University/Productive Sector Linkages	X	X	X	
- Communication Strategies for Bioindustries		X		
POSITIVE/NEGATIVE IMPACT. BIOSAFETY				
- Impact of Patenting on Farmers			X	
PARTICIPATION AT INTERNATIONAL FORA				
- Meeting on Biotech for Food Production			X	
- Meeting on Biotech for Improvement of Crops			X	
- Tissue culture for Conservation of Biodiversity & Plant Genetic Resources		X		